

MAT-7855US



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IFW

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Number: 6,740,183  
Issued: May 25, 2004  
Name of Patentee: Segawa et al.  
Title of Invention: METHOD OF PRODUCING CERAMIC MULTI-LAYERED SUBSTRATE

**REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. § 1.322**

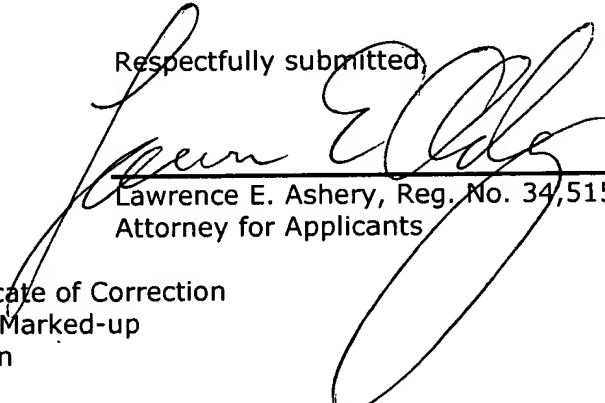
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This Request is being filed to request consideration of a Request for Certificate of Correction which was previously filed on November 4, 2004 (copy enclosed).

The Request for Certificate of Correction states that there are errors on the title page, in the Abstract. The Abstract should read as amended in the Marked-up Copy of Specification Showing Additions and Deletions (copy enclosed).

It is respectfully requested that these errors be corrected in a Certificate of Correction.

Respectfully submitted,

  
Lawrence E. Ashery, Reg. No. 34,515  
Attorney for Applicants

LEA/dlm

Enclosure: Copy of Request for Certificate of Correction  
Copy of pages 1 and 12 of Marked-up  
Copy of Specification

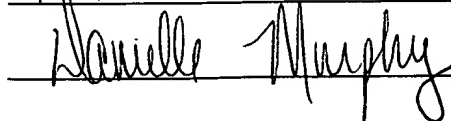
Dated: April 13, 2005

P.O. Box 980  
Valley Forge, PA 19482  
(610) 407-0700

The Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. 18-0350 of any fees associated with this communication.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 Attn: Decision and Certificate of Correction Branch of the Patent Issue Division on:

April 13, 2005



**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

PATENT NO: **6,740, 183**  
DATED: **May 25, 2004**  
INVENTORS: **Segawa et al.**

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

Item [57], **ABSTRACT**,

Line 2, delete "to remove a" and insert --the removal of--.

Line 3, delete "sheet" and insert --sheets--.

Line 4, delete " sheets are" and insert --sheet is--.

Line 6, delete " For removing the shrinkage suppression sheets on both faces of the multi-layered ceramic substrate 2 after sintering, water" and insert --Water--.

Line 8, after "or" insert --a--.

Line 9, after "sprayed" insert --,--.

Line 10, after "air." insert --onto the shrinkage suppression sheets, on both faces of the multi-layered ceramic substrate, after sintering, to remove the shrinkage suppression sheets.--.

Mailing Address of Sender:

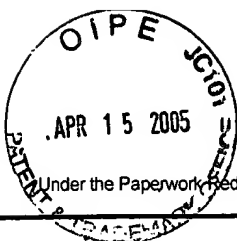
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Patent No. **6,740, 183**

No. of Additional Copies:

This collection of information is required by 37 CFR 1.322, 1.323 and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/21 (09-04) (AW 10/2004)

Approved for use through 7/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number Patent No. 6,740,183

Filing Date Issued: May 25, 2004

First Named Inventor Segawa et al.

Art Unit

Examiner Name

Attorney Docket No. MAT-7855US

**ENCLOSURES (Check all that apply)**☐ Fee Transmittal Form☐ Fee Attached☐ Amendment/Reply☐ After Final☐ Affidavits/Declaration(s)☐ Extension of Time Request☐ Express Abandonment Request☐ Information Disclosure Statement☐ Certified Copy of Priority Document(s)☐ Response to Missing Parts/  
Incomplete Application☐ Response to Missing Parts  
under 37 CFR 1.52 or 1.53☐ Drawing(s)☐ Licensing-related Papers☐ Petition☐ Petition to Convert to a  
Provisional Application☐ Power of Attorney, Revocation,  
Change of Correspondence  
Address☐ Terminal Disclaimer☐ Request for Refund☐ CD, Number of CD(s) \_\_\_\_\_  
☐ Landscape Table on CD☐ After Allowance Communication  
to TC☐ Appeal Communication to Board  
of Appeals and Interferences☐ Appeal Communication to TC  
(Appeal Notice, Brief, Reply  
Brief)☐ Proprietary Information☐ Status Letter☒ Other Enclosure(s) (please  
identify below): Request for  
Reconsideration under 37  
C.F.R. §1.322; copy of Request  
for Certificate of Correction,  
PTO Form 1050, pages 1 and 2  
of marked-up specification**Remarks:****SIGNATURE OF APPLICANT, ATTORNEY OR AGENT**

Firm Name RatnerPrestia

Signature

Printed Name Lawrence E. Ashery

Date April 13, 2005

Registration No. 34,515

**CERTIFICATE OF TRANSMISSION / MAILING**

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature

Typed or Printed Name Danielle Murphy

Date April 13, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Office, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, ALEXANDRIA, VA 22313-1450.

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COPY

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Number: 6,740,183  
Issued: May 25, 2004  
Name of Patentee: Segawa et al.  
Title of Invention: METHOD OF PRODUCING CERAMIC MULTI-LAYERED SUBSTRATE

**REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT  
FOR PTO MISTAKE (37 C.F.R. § 1.322(a))**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Attention: Decision and Certificate of Correction  
Branch of the Patent Issue Division

1. Attached in duplicate is Form PTO-1050 with at least one copy being suitable for printing.
2. Correction of the Official Letters Patent is respectfully requested in view of the following text which appears correctly in the application file:

On the title page, in the abstract, line 2 of Letters Patent, delete "to remove a" and insert --the removal of-- as indicated in line 3 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 3 of Letters Patent, delete "sheet" and insert --sheets-- as indicated in line 3 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 4 of the Letters Patent delete "sheets are" and insert --sheet is-- as indicated in line 4 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 6 of the Letters Patent delete "For removing the shrinkage suppression sheets, on both faces of the multi-layered ceramic substrate 2 after sintering , water" and insert --Water-- as indicated in line 6 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 8 of the Letters Patent after "or" insert --a-- as indicated in line 7 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 9 of Letters Patent after "sprayed" insert --,-- as indicated in line 8 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

On the title page, in the abstract, line 10 of Letters Patent after "air." insert --onto the shrinkage suppression sheets, on both faces of the multi-layered ceramic substrate, after sintering, to remove the shrinkage suppression sheets.-- as indicated in line 8 on page 12 of the marked-up copy of specifications showing additions and deletions filed December 14, 1999.

3. Please send the Certificate to:

Name:

Lawrence E. Ashery  
P.O. Box 980  
Valley Forge, PA 19482  
(610) 407-0700

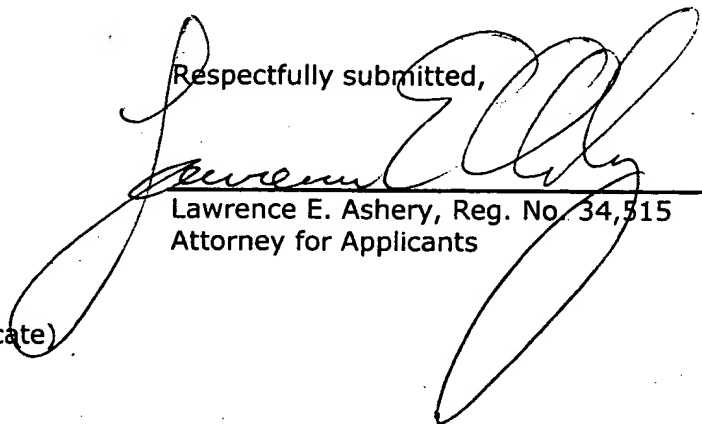
Name of Assignee: Matsushita Electrical Industrial Co., LTD.

Assignment Recorded on: April 24, 2000

Reel: 010788

Frame: 0064

Respectfully submitted,

  
Lawrence E. Ashery, Reg. No. 34,515  
Attorney for Applicants

LEA/rrc

Enclosure: Form PTO-1050 (in duplicate)

Dated: November 4, 2004

P.O. Box 980  
Valley Forge, PA 19482  
(610) 407-0700

The Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. 18-0350 of any fees associated with this communication.

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November 4, 2004  


**METHOD FOR MANUFACTURING A MULTI-LAYERED CERAMIC  
SUBSTRATE****FIELD OF THE INVENTION**

5 The present invention relates to the field of methods for manufacturing a multi-layered ceramic substrate used for electronic devices, and in particular to methods for manufacturing a ~~so-called~~ non-shrinkable multi-layered substrate which greatly suppresses shrinkage of the substrate during firing.

**BACKGROUND OF THE INVENTION**

10

Normally, multi-layered ceramic substrates are manufactured using a method called the green sheet lamination method. In this method, green sheets, made by forming a slurry containing ceramic powder and organic binder into a sheet, are punched (for holes) and screen printed with conductive paste. These  
15 green sheets are stacked to the required number, press-heated to laminate the layers, and then fired.

The advantages of this method include the feasibility of fine pattern printing realized by the extremely flexible green sheet and good permeability to organic solvents, and good surface smoothness and air-tightness which allow the  
20 lamination of even up to several dozens of layers.

On the other hand, the main disadvantage is the difficulty in achieving dimensional accuracy. This is due to shrinkage of the ceramic substrate accompanied by sintering which occurs during firing~~it~~. Inaccurate dimensions cause mismatching between components and conductive patterns, generating the  
25 serious problem of inability to mount semiconductor chips such as CSPs (chip size packages) and MCMs (multi-chip modules) with high accuracy.

**ABSTRACT OF THE DISCLOSURE**

A method for manufacturing a multi-layered ceramic substrate which enables the removal of to remove a shrinkage suppression sheets without damaging the multi-layered substrate. The shrinkage suppression sheets is are formed on both

5 faces of unfired laminated green sheets, and then the laminated green sheets are fired. ~~For removing the shrinkage suppression sheets on both faces of the multi-layered ceramic substrate 2 after sintering, water~~ Water, ceramic powder, or a water and ceramic powder mixture is sprayed, together with compressed air, onto the shrinkage suppression sheets, on both faces of the multi-layered ceramic substrate,

10 after sintering, for to removeal of the shrinkage suppression sheets.